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Modification of oligolactic acid with tetracarboxylic p-tert-butylthiacalix[4]arene derivatives: Effect of macrocyclic fragment configuration on aggregation and thermal properties of copolyesters

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Abstract

© ISUCT Publishing. A novel approach to modification of oligolactic acid with three stereoisomers (cone, partial cone, 1,3-alternate) of p-tert-butylthiacalix[4]arene carboxylate derivatives has been developed. Using non-covalent self-assembly in dichloromethane, submicron spherical particles with 701 (cone), 362 (partial cone), 371 nm (1,3-alternate) size were obtained. Nanoprecipitation in the acetone-water mixture allowed forming particles of lower diameter, i.e. 191 (cone), 155 (partial cone) and 98 nm (1,3-alternate). It was shown by simultaneous thermogravimetry and differential scanning calorimetry that introduction of the macrocyclic fragments into the oligolactic acid increased its thermal stability. The temperature corresponding to the start of thermal decomposition was shifted from 246 °C (non-modified oligolactic acid) to 263 °C (that modified with macrocycles in partial cone and cone conformations) and 278 °C (derivative of 1,3-alternate).

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Keywords

Copolyesters, Oligolactic acid, Self-aggregation, Thermostability, Thiacalix[4]arene

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